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10/534,821	05/13/2005	Ken-ichi Masumoto	2005-0796A	8749

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EXAMINER	
RAINEY, ROBERT R	
ART UNIT	PAPER NUMBER
2629	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/534,821	MASUMOTO ET AL.	
	Examiner	Art Unit	
	ROBERT R. RAINEY	2629	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 January 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3 and 6-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3 and 6-19* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 May 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. The amendments to claim 1 filed 1/28/2009 effectively overcome the 35 U.S.C. § 112 first paragraph rejection of the claim and the objection to the drawings.

2. Applicant's arguments filed 1/28/2009 regarding the 35 U.S.C. § 103(a) rejections of claims 13-17 have been considered but are moot in view of the new ground(s) of rejection. However, examiner offers the following in as much as the arguments may apply to the new rejections.

On page 11, applicant argues that Wei does not teach that a residual electric charge in the organic electro luminescence element is discharged after an application of a DC forward voltage to the organic electro luminescence element is stopped, the discharge of the residual electric charge resulting in a reverse current that is fed to the organic electro luminescence element through a defective part of the organic electro luminescence element, the defective part of the organic electro luminescence element having a low resistance. Applicant's reasoning is that Fig. 1 and 2 of Wei show a capacitive element 12 with associated current I_C and diode element 11 with associated current I_D with no negative going pulse identified as part of I_D.

The problem with this argument is that the representation of diode element 11 and capacitive element 12 are a lumped parameter model of an LED and its interconnects rather than a representation of discrete devices. The rejection of

claim 15 in the previous office action pointed this out and Wei 2:58-3:5 makes this clear:

> Turning now to the drawings, FIG. 1 is a schematic diagram of a driver 10 and light emitting device (LED) 11 which is being explained to illustrate problems which arise when driving a light emitting device having a capacitance associated therewith. LED 11 has a capacitance 12 associated therewith, which includes internal capacitance and any capacitance in the electrical connections between LED 11 and driver 10, etc. In the present example, LED 11 is an organic light emitting device (although it is anticipated that other light emitting devices having associated capacitance might be utilized) which includes internal capacitance due to overlying layers of material sandwiched between electrical conductors. Further, LED 11 is one pixel in a two dimensional array of pixels and the column and row conductors add some capacitance to the devices.

Since this is a model of a real device using ideal elements, the resulting model waveforms would not show a negative going pulse through an ideal diode as that is contrary to the nature of an ideal diode. Wei commits imprecision in referring to diode element 11 as an organic light emitting diode but then treating the drawn elements as model rather than as actual elements. That the drawn elements are model elements rather than actual elements was reasonably suggested to one of ordinary skill in the art by reading the underlined passage above since it is impossible to remove the capacitance from a real device and place it instead in another device. At least the charge stored in the capacitance of the sandwiched

layers of the OLED would contribute to the negative going portion of waveform I_C and flow through the OLED.

A second problem with applicant's position that Wei does not teach the claimed elements is pointed out in the rejection of claim 13. Briefly, this problem is that the structure and its operation as taught by Wei inherently performs the elements that applicant believes are not taught. Even if I_C were a real element and Wei offered no indication of a negative going current through the OLED, the function would be the same, necessarily performing the argued limitations.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1, 3 and 6-19** are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Application Publication No. 2003/0098829 to *Chen et al*. ("*Chen*") in view of U.S. Patent No. 5,723,950 to *Wei et al*. ("*Wei*").

As to **claim 13**, *Chen* discloses an active matrix OLED/PLED pixel driving circuit and in particular:

A light emitting device comprising:

a current feeding circuit (see for example Fig. 3A at least item 34);

a first switching element (see for example Fig. 3A item 33); and

an organic electro luminescence element having an anode connected with the first switching element and a cathode connected with the earth (see for example Fig. 3A item 36 and [0014]; note that it is well known that OLEDs are organic electro luminescence elements; that the cathode connects to earth, i.e. a return potential, would have been fairly suggested to one of ordinary skill in the art),

wherein an end of the first switching element is connected with the current feeding circuit (see for example Fig. 3A).

Chen does not expressly disclose a second switching element such that the circuit comprises:

a push-pull circuit including a first switching element and a second switching element that are cascaded; and

an organic electro luminescence element having an anode connected with a connecting point of the first switching element and the second switching element, and a cathode connected with the earth,

wherein an end of the push-pull circuit is connected with the current feeding circuit, and another end of the push-pull circuit is connected with the earth.

Wei discloses a precharge driver for light emitting devices (see for example title) that include organic LEDs with an associated internal capacitance (see for example 1:53-1:57 or 2:58-3:5) and in particular:

a push-pull circuit including a first switching element (see for example Fig. 1 item 20) and a second switching element (see for example Fig. 1 item 21) that are cascaded; and

an organic electro luminescence element (see for example Fig. 1 items 11 and 12; note that 1:53-1:57 and 2:58-3:5 point out that item 12 is a lumped capacitance element that represents the capacitance of the OLED device as well as that of the wiring) having an anode connected with a connecting point of the first switching element and the second switching element (see for example Fig. 1), and a cathode connected with the earth (see for example Fig. 1 and 2; the cathode is connected through transistor 30, which during the switching described in Fig. 2 "... operates as a current sink" 4:44-47, so it is connected in the sense that a circuit path can be traced from the cathode to earth as well as in the sense that an electrical path to earth is provided during the operation of the first and second switches),

wherein an end of the push-pull circuit is connected with the current feeding circuit and another end of the push-pull circuit is connected with the earth (see for example Fig. 1), and

wherein a residual electric charge in the organic electro luminescence element is discharged after an application of a DC forward voltage to the organic electro luminescence element is stopped (see for example Fig. 1 and 2; note that when transistor 20 is turned off and transistor 21 is turned on the direction of current through the lumped element capacitor 12, I_C, is reversed representing the

discharge of the capacitor; as previously noted this capacitor represents the capacitance of the OLED as well as other capacitances thus the discharge of the capacitance associated with the OLED is taught; note that even without the explicit teaching of residual electric discharge, the circuit of Wei would still inherently produce the claimed result and thus anticipate the limitation), the discharge of the residual electric charge resulting in a reverse current that is fed to the organic electro luminescence element through a defective part of the organic electro luminescence element (this is inherent in the function of the circuit when combined with the nature of the electro luminescence elements themselves and thus taught), the defective part of the organic electro luminescence element having a low resistance (this is just a feature inherent in the electroluminescent element and thus taught).

Chen and *Wei* are analogous art because they are from the same field of endeavor, which is matrix type displays.

At the time of invention, it would have been obvious to a person of ordinary skill in the art to add the push-pull element drive arrangement disclosed by *Wei* to the drive circuit of *Chen* for example by replacing the single FET33 with dual FETs such as FETs 20 and 21, with appropriate polarity considerations. The suggestion/motivation would have been to provide advantages such as to discharge the capacitance of the display element and any signal line capacitances quickly in order to assure quick extinguishment of light emission.

As to **claim 14**, in addition to the rejection of claim 13 over *Chen* and *Wei, Wei* further discloses that the push-pull circuit connects the anode of the organic electro luminescence element with the earth through the second switching element by turning on the second switching element, the second switching element being located between the connecting point and the earth (see for example Fig. 1 noting the connections of transistor 21).

As to **claim 15**, in addition to the rejection of claim 14 over *Chen* and *Wei, Wei* further discloses that a current for lighting the organic electro luminescence element is fed from the current feeding circuit to the organic electro luminescence element through the first switching element when the first switching element is turned on and the second switching element is turned off (see for example Fig. 1 and 4:16-39), and subsequently the residual charge in the organic electro luminescence element is discharged through the second switching element when the first switching element is turned off and the second switching element is turned on (see for example Fig. 1 and 2; note that when transistor 20 is turned off and transistor 21 is turned on the direction of current through the lumped element capacitor 12, I.sub.C, is reversed representing the discharge of the capacitor; as previously noted this capacitor represents the capacitance of the OLED as well as other capacitances thus the discharge of the capacitance associated with the OLED is taught; further note that the fact that Wei describes several other benefits and functions of the circuit does not detract

from the fact that it also discharges the residual charge in the organic electro luminescence element).

As to **claim 16**, in addition to the rejection of claim 13 over *Chen* and *Wei, Chen* further discloses that the current feeding circuit includes a capacitive element (see for example Fig. 3A item 35) for accumulating an electric charge supplied by a power supply terminal and that a lighting current is fed to the organic electro luminescence element through the first switching element from the capacitive element of the current feeding circuit when the first switching element is turned on; and *Wei* further discloses that a lighting current is fed to the organic electro luminescence element through the first switching element of the current feeding circuit when the first switching element is turned on and the second switching element is turned off (see for example Fig. 1 and 4:16-39).

As to **claim 17**, in addition to the rejection of claim 16 over *Chen* and *Wei, Chen* further discloses that the organic electro luminescence element performs static lighting by charging the capacitive element of the current feeding circuit with the electric charge when the first switching element is turned off (see for example Chen Fig. 3A and [0009]).

As to **claim 19**, in addition to the rejection of claim 13 over *Chen* and *Wei*, *Wei* further discloses the inversion of the sense of the logic signal between the first and second transistors (see for example Fig. 1).

Examiner takes official notice that placing an inverter in the path between a logic signal and a switching transistor in order to invert the sense of the logic signal applied to the transistor was well known in the art at the time of the invention.

The prior art device of *Chen* and *Wei* differs from the claimed device only by the substitution of a transistor and an external inverter for the transistor with intrinsic inversion of the logic signal. The replacement device and its function was known in the prior art. The recognition of the interchangeability of the devices would have required no more than ordinary skill in the art and the implementation of the substitution would have required no more than ordinary skill in the art. Thus one of ordinary skill in the art could have implemented the claimed invention.

Claims 1, 3, 7 and 8 are rejected on the same grounds and arguments as claim 13.

As to **claim 6**, *Chen* further discloses that a signal different from the control signal is utilized for controlling the application of the DC forward voltage to the organic electro luminescence element (see for example Fig. 1 noting that

the logical sense of the signal applied to transistor 20 is inverted from the logical sense of the signal applied to transistor 21, that is in a case in which transistor 20 is turned on a signal is sent that turns on transistor 20 and a control signal is sent that turns off transistor 21, thus the signal applied to transistor 20 is different from the control signal applied to transistor 21 because the control achieved is different). If it were held that the claim should be read that the two signals must be generated by separate active elements, the claimed modification would still have required no more than ordinary skill in the art to so implement the circuit. It would have been an obvious matter of design choice to use such a separate signal, since applicant has not disclosed that using a separate signal solves any stated problem or is for any particular purpose and it appears that the invention would perform equally well with the use of the commonly produced signal as in *Chen* and *Wei* and applicants other claims. The suggestion/motivation for such a design choice would have been to provide advantages such as to prevent potential overlap of on states between the push-pull transistors.

Claim 9 is rejected on the same grounds and arguments as claim 14.

Claim 10 is rejected on the same grounds and arguments as claim 15.

Claim 11 is rejected on the same grounds and arguments as claim 16.

Claim 12 is rejected on the same grounds and arguments as claim 17.

Claim 18 is rejected on the same grounds and arguments as claim 19.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT R. RAINEY whose telephone number is (571)270-3313. The examiner can normally be reached on Monday through Friday 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amare Mengistu can be reached on (571) 272-7674. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/RR/

/Amare Mengistu/
Supervisory Patent Examiner, Art Unit 2629